

## **Who is “Income” Wealthier? Introducing the Retirement Sustainability Quotient**

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Douglas Brodie is 59 and lives across the street from Denise Coburg who is 57, in a leafy suburb of Toronto. They are both currently single and vaguely know each other in a social context. They also share an ominous and rapidly approaching sixtieth birthday. Like many Canadian baby boomers they are coming to the realization that retirement and the years beyond work are just around the corner.

At first glance Denise Coburg is in a far better financial situation compared to Douglas Brodie. Denise is an accountant at a medium-sized consulting firm and earns approximately \$130,000 per year pre-tax. This places her within the upper fifth of Canadians in terms of annual income. Her house is mortgage-free and is worth approximately \$500,000 at current prices. And, although she doesn't have a formal pension plan at work, she has been very careful to contribute the maximum to her Registered Retirement Savings Plan (RRSP), which is now worth approximately \$750,000. The “asset allocation” within her RRSP is quite conservative, utilizing a variety of safe money market and bond mutual funds. Indeed, she is well ahead of the median Canadian family unit in her income bracket, who only has \$187,000 in private pension assets and a net worth of \$505,000<sup>1</sup>.

### **FINANCIAL SUMMARY**

	<b>Douglas Brodie</b>	<b>Denise Coburg</b>
<b>Pre-tax salary</b>	\$75,000	\$130,000
<b>Assets</b>		
Value of house	\$400,000	\$500,000
RRSP savings	\$160,000	\$750,000
<b>Debts</b>		
Outstanding mortgage balance	\$150,000	None
Other Debts	\$44,000	None

In contrast to Ms. Coburg's diligent financial planning and sound personal balance sheet, Mr. Brodie hasn't been as careful with his wealth in general or his investments in particular. He works as a high school gym teacher and part-time science instructor for the local school board, earning approximately \$75,000 per year, before taxes and any payroll deductions.

<sup>1</sup> Source: Statistics Canada, Survey of Financial Security, 2005

His modest townhouse worth approximately \$400,000 still has a \$150,000 mortgage outstanding. As well, he has a line of credit with a balance owing of \$40,000 and \$4,000 in credit card and other debts. He has only managed to accumulate \$160,000 in his RRSP, which is invested entirely in an assortment of risky equity-based mutual funds. However, his tenured job at the school entitles him to a pension which pays 1.75% per year of service multiplied by his final year's salary, when he eventually retires.

### **Main Question: *Who is better prepared for retirement?***

Although using conventional measures of balance sheet wealth it appears that Denise Coburg is in a better financial position, we believe that an argument can be made that the exact opposite is true. Douglas Brodie has a higher Retirement Sustainability Quotient (RSQ) – which is a concept we will soon explain -- compared to Denise. Moreover, unless she makes significant changes to both her (i) *product allocation* and her (ii) *asset allocation* she faces a relatively high risk of exhausting her nest egg during her retirement years. Let us explain.

### **It's All about Maintaining a Standard of Living, for Life**

To understand why their true financial situation might not be as clear-cut as it appears at first glance, let's assume that both Douglas and Denise would like to generate a retirement income that is approximately 85% of their current working take-home pay. Financial advisors and experts have differing opinions and views as to the exact percentage retirees require and should aim for. Some commentators claim that a mere 50% replacement rate is enough, while others have gone so far as to argue that 100% might not be sufficient, when retiree inflation and healthcare needs are considered. We seek to avoid this debate and axiomatically use a target rate of 85% simply in order to argue our main point.

*So, will Douglas and Denise be able to maintain this standard of living?* For Douglas the high school teacher the 85% target would imply an (average) pre-tax income of \$63,750 per year. The equivalent target for Denise would be an (average) pre-tax \$110,500 per year, for life. Both numbers are crude estimates and pre-tax values, although we will revisit this assumption a bit later. Also, let's assume that Douglas plans to retire in 3 years, at the age of 62, which is when he is entitled to a full pension after 30 years of service. In contrast, Denise is likely to wait 10 more years, to the age of 67, primarily because she doesn't have a pension (or the institutionalized incentive to retire early).

### **Pension Income**

We start by computing their Canadian Pension Plan (CPP) and the Old Age Security (OAS) entitlement, assuming they have both worked the maximum number of years required. Using today's (2008) dollars, the entitlement would be roughly \$15,000 per year (pre-tax and pre-claw-backs). In addition – and this is quite important -- Doug is entitled to guaranteed lifetime income from the DB pension plan, which works out to \$39,375 per year. Overall, he will receive a total projected income of \$54,375 for the rest of his natural life. This is approximately \$9,375 short of his 85% replacement rate target.

Now, if his \$160,000 RRSP earns 7% over the next 3 years, which is quite plausible given his asset allocation, it would grow to \$196,000 by retirement. According to (analytic) Retirement Monte Carlo estimates, a spending rate of 4.78% (or \$9,375) from a portfolio nest egg of \$196,000 leads to a “retirement income sustainability probability” of 84%. In other words, given Doug’s product allocation and asset allocation, there is a 16% chance that his RRSP will fall short of filling the income gap.

Finally, in order to compute what we label Doug’s Retirement Sustainability Quotient (RSQ), we must include the asset that is not captured by the traditional balance sheet. We are referring to his guaranteed lifetime of income – the combined pension and CPP – which is extremely valuable from a retirement security perspective. The actuarial present value of this annuity, using reasonable discount factors for Doug at retirement, would be \$663,700. Stated differently, Doug would need a lump sum of \$663,700 to purchase or create a guaranteed lifetime income stream equivalent to the pension.

Stay with us here. We now get to the main point of this analysis. You must think of Doug’s projected retirement assets consisting of two parts: *explicit* financial capital (EFC) and *implicit* financial capital (IFC). The EFC is projected to be \$196,000 and the IFC is projected to be \$663,700. In total he is projected to have \$859,700 of financial capital (FC) at retirement. Once again, of this amount, 23% is explicit (mathematically calculated as EFC/FC) and 77% is implicit (mathematically calculated as IFC/FC).

Here is the final step to computing Doug’s RSQ. As mentioned above, the probability that the explicit financial capital (EFC) will generate the necessary annual income to meet his target income gap of \$9,375 is 84%. However, since the value of his pension income is known, and he is guaranteed to receive it for the duration of his retirement, the success rate associated with the implicit financial capital (IFC) is 100%. Finally, taking a weighted average of the two values leads to his overall retirement sustainability quotient (RSQ) of 96% (=77% \* 100% + 23% \* 84%).

**Doug’s Retirement Sustainability Quotient (RSQ)**

Category	Chances of income sustainability	Allocation to category
Non-guaranteed income (from RRSP account)	84%	23%
Guaranteed income (pension, CPP)	100%	77%
<b>Overall RSQ</b>	<b>96%</b> (=77% * 100% + 23% * 84%).	

Now let us compare Doug’s RSQ value to Denise’s. We begin by considering the only guaranteed stream of lifetime income that Denise will receive, namely the Canadian Pension Plan and Old Age Security. The actuarial present value of this income at retirement is \$174,800 and this sum can be treated as the implicit part (the IFC) of her overall financial capital. Subtracting the annual pension amount from her target income of \$110,500 leaves her with an income gap of \$95,500. Her income gap is much larger than Doug’s, primarily due to her lack of defined benefit pension and guaranteed lifetime income.

To fund this retirement needs gap, she will have to rely entirely on her RRSP account. Assuming Denise's conservatively allocated portfolio earns a steady 5% in each of the next 10 years prior to retirement, her RRSP account will grow to \$1,221,700. Combining this projected explicit financial capital (EFC) with her implicit financial capital (IFC) of \$174,800 leaves her with a total projected nest egg or financial capital of \$1,396,500.

Now, if the conservative asset allocation within her RRSP remains unchanged, the probability that she will be able to draw \$95,500 per year from her RRSP account for the remainder of her life is a mere 67%. This, too, comes from (analytic) Retirement Monte Carlo analysis. And while there is a 100% probability that she will receive the annual CPP and OAS payments, this implicit financial capital (IFC) comprises only 13% of her total projected \$1,396,500 nest egg at retirement. Again, the remaining 87% of this nest egg is allocated to explicit financial capital.

Finally, taking a weighted average of the two probability values – 67% and 100%, based on the implicit and explicit financial capital portions, leads to an overall retirement sustainability quotient (RSQ) of approximately 71% for Denise. This is a full 25 percentage points lower than Doug.

So at first glance – following up on the fundamental question we posed in the title – it might appear at first glance that Denise's retirement savings and net worth translate into a high chance of retirement success. However, their respective RSQ numbers tell a different story. Doug's implicit financial capital, as measured by the actuarial present value of his lifetime pension, places him ahead of Denise with respect to retirement income sustainability. This is our main point.

### **What can Denise do to increase her RSQ?**

What if Denise is advised to allocate her RRSP funds more aggressively and shifts her allocations towards a 60% equity and 40% bond portfolio? Assuming her account grows to \$1,368,700 as a result of the new asset allocation, her chances of filling her target income gap increase to 76%. Her reassessed overall weighted average RSQ value will slightly increase to 79%. This is better, but clearly asset allocation adjustments will not be enough. Our recommendation and one of the main takeaways from this simple story is that Denise should consider investing in or allocating more of her total capital to implicit financial capital with greater sustainability, or products that guarantee a lifetime of income, similar to a DB pension.

For instance, suppose Denise adapts the 60% equity and 40% bond allocation within her RRSP fund today, *and*, in addition, allocates roughly 44% of her retirement nest egg (which is projected to be \$1,368,700) to other guaranteed retirement income products. The \$600,000 sum could be allocated amongst lifetime payout annuities (SPIA products) and guaranteed living income benefits (such as GMWB products).

To see the impact of adding just one product, let's assume that the sum is used to purchase a pension-like lifetime payout annuity. While this product has no cash value and would offer no death benefit to Denise's heirs, it would promise to pay out a rate of 8% per year, for the duration of Denise's retirement. This new source of income combined with her government pension, would provide Denise with a guaranteed stream of income paying her \$63,100 annually.

Assuming this product allocation, we can – as we did in the earlier exercise -- convert this lifetime income into an "implicit financial capital" figure equal to \$735,500, which is 49% of her total financial capital. Her explicit financial capital (her RRSP account) would be used to fund her target income gap of \$47,400 with a sustainability probability of 82%. Finally, multiplying the sustainability probabilities of each category (EFC and IFC) by their respective weights results in a total Retirement Sustainability Quotient of 91%. While Denise could have selected an allocation among other guaranteed income products and in varying proportions, the point is that adapting a comprehensive product allocation strategy could significantly improve Denise's chances of meeting her retirement income goal.

**Denise Coburg's Overall RSQ**

Existing (Conservative) Asset Allocation	Changing to a 60% equity and 40% bond asset allocation	Introducing Product Allocation AND 60% equity and 40% bond asset allocation
71%	79%	91%

**Product Allocation vs. Asset Allocation**

There is a general consensus among financial professionals that asset allocation is the single most critical investment decision in the asset accumulation phase. That is, the main determinant of relative success and failure is one's mix of stocks, bonds and cash; more so than security selection. However, we believe that new challenges and risks arise in retirement which were largely absent in the asset accumulation phase. Lifetime income, maintaining purchasing power and avoiding the negative impact of the sequence of investment returns take on much greater importance around and during the transition to retirement. As a result, once the retiree begins to mine the nest egg for retirement income, conventional asset allocation can no longer be viewed as the core strategy for achieving retirement sustainability.

In contrast, the concept that will allow retirees to hedge against adverse outcomes of retirement risk variables and aid them in reaching their retirement income and estate goals will be *product allocation*. Specifically, we use this term to describe the allocation of financial retirement capital among guaranteed and non-guaranteed retirement income products. The list of guaranteed products may include lifetime payout annuities or pensions and guaranteed living income benefits, while a systematic withdrawal plan provides non-guaranteed retirement income.

We illustrated that both Doug and Denise are able to achieve a relatively high RSQ using an effective allocation among two retirement income products or strategies. In various combinations and along with an optimized underlying asset allocation, these types of retirement income products will allow one to effectively manage retirement income risks and maximize the retirement sustainability quotient.

### **What Have We Missed?**

Now, some might argue that Denise is still better off for a variety of other non-pension related reasons. After all, she has a fully paid-off house and is now debt free, while Doug still has a mortgage. But then again, this is a questionable assumption in today's real estate environment. We would further argue that unless they both plan to sell their house and trade down, or enter into a reverse mortgage, it should not be considered part of the initial retirement income equation.

There are obviously a number of other issues we have deftly by-passed. For example, Doug and Denise are likely in different marginal tax brackets. Denise pays a greater fraction of her income in Federal and Provincial taxes, and hence would have to replace a greater percentage of her pre-tax income to generate a given after-tax replacement rate. Likewise, certain government benefits in retirement will be clawed back and reduced at higher income levels. Indeed, the list of additional issues one can worry about is quite extensive. Nevertheless, the main message – and the main point of this brief note -- remains relatively unscathed, even under a more realistic (and quite cumbersome) set-up. Guarantees are valuable.

### **Concluding Thoughts**

Retirement wealth should not just be measured exclusively in a “stock” of dollars and cents. Rather, it should also be measured in the “flow” units of lifetime income. According to Statistics Canada, approximately 1 in 5 Canadians do not have any form of DB pension other than a basic entitlement to CPP. Canadians within the 55-to-64 age group are approaching retirement with a median nest egg (i.e. what we called explicit financial capital) of only \$242,500. Yet, a retiree trying to generate a lifetime income of say \$50,000 per year would require a nest egg of at least \$1,400,000 in order to generate a 90% RSQ.

We conclude by urging Canadians approaching retirement to focus on their “product allocation” as well as their traditional “asset allocation”. To that end, we advocate that retirees allocate a portion of their investment nest egg to products that guarantee a lifetime of income, similar to Defined Benefit pensions -- especially for those who do not have them -- as opposed to only considering investments that generate financial returns.

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